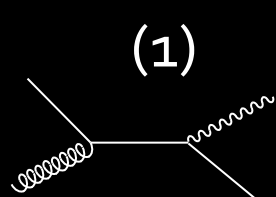


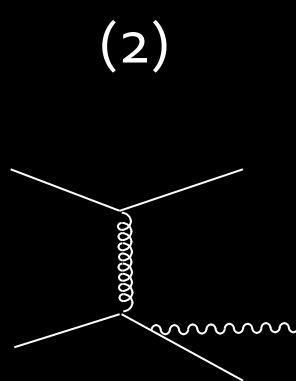
# what do we mean by "Direct"....

proton - proton:

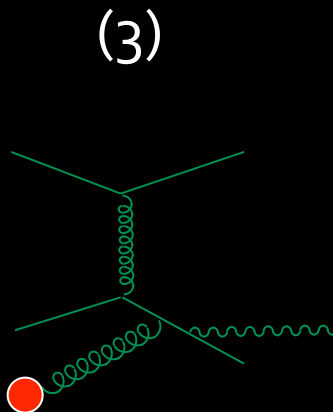
Au - Au or d-Au



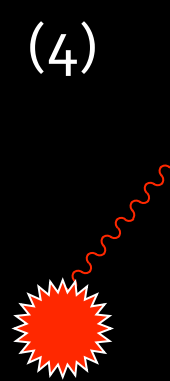
Prompt



"Fragmentation" much better called internal bremsstrahlung



Induced

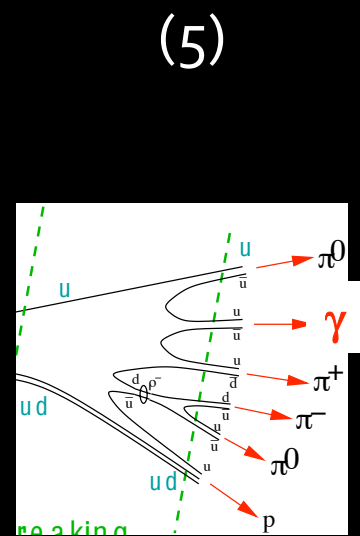


De-excitation for excited states

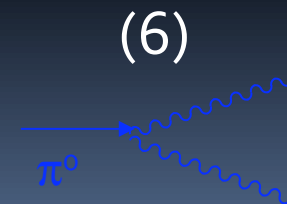


Thermal Radiation

QGP / Hadron Gas



Fragmentation



EM & Weak Decay

# What is in Pythia 6.4

## □ Processes included which would fall under prompt (1)

- ◆ 14:  $q\bar{q} \rightarrow g\gamma$
- ◆ 18:  $q\bar{q} \rightarrow \gamma\gamma$  (19:  $q\bar{q} \rightarrow \gamma Z^0$       20:  $q\bar{q} \rightarrow \gamma W^+$ )
- ◆ 29:  $qg \rightarrow q\gamma$
- ◆ 114:  $gg \rightarrow \gamma\gamma$
- ◆ 115:  $gg \rightarrow g\gamma$  (106:  $gg \rightarrow J/\Psi\gamma$       116:  $gg \rightarrow Z^0\gamma$ )

## ◆ initial and final internal bremsstrahlung (g and $\gamma$ ) (3)

- Pythia manual section 2.2

## ◆ Process 3 and 4 are for sure not in pythia

## ◆ I'm still checking 5

## ◆ the decay of resonances like the $\pi^0$ is of course in pythia